



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,175	06/02/2006	Wojtek Sudol	US030475US	7542
24737 7590 09/21/2009 PHILIPS INTELLECTUAL PROPERTY & STANDARDS P.O. BOX 3001 BRIARCLIFF MANOR, NY 10510				
EXAMINER DOUGHERTY, THOMAS M				
ART UNIT 2837		PAPER NUMBER		
MAIL DATE 09/21/2009		DELIVERY MODE PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/596,175

**Applicant(s)**

SUDOL, WOJTEK

**Examiner**

Thomas M. Dougherty

**Art Unit**

2837

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 7/08/09.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 20-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-893)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 9 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Eberle et al. (US 6,618,916). Eberle et al. show (figs. 1, 2) an ultrasound transducer probe, comprising: a support substrate (2) having a non-linear surface; an integrated circuit (6) physically coupled to the support substrate (2) overlying the non-linear surface, wherein said integrated circuit (6) substantially conforms to a shape of the non-linear surface; and an array of piezoelectric elements (8) coupled to said integrated circuit (6).

Said integrated circuit (6) is physically attached (bonded) to the support substrate via at least one of an adhesive and an epoxy. See col. 9, ll. 39 and 40.

The non-linear surface of said support substrate (2) includes a smooth curved surface.

The smooth curved surface has a radius of curvature selected as a function of a desired ultrasound transducer probe application, wherein the desired ultrasound transducer probe application includes one selected from the group consisting of a cardiac application, an abdominal application, and a transesophageal application. See figure 13.

Said array of piezoelectric elements (8) includes a two- dimensional array of piezoelectric transducer elements.

Said array of piezoelectric elements (8) is coupled to said integrated circuit via flip-chip conductive bump connections. See col. 12, ll. 35-40.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 8 is rejected under 35 U.S.C. 103(a) as obvious over Eberle et al. (US 6,618,916). Eberle et al. do not note the base material of his integrated circuit.

It would have been obvious to one having ordinary skill in the art to employ any of silicon, gallium or germanium as a base material for the integrated circuit in the device of Eberle et al. at the time of their invention since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Claims 6, 7, 11, 12, 16 and 17 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Eberle et al. (US 6,618,916). Given the invention of Eberle et al. as noted above, they do not note that the integrated circuit includes an active region nor that their support substrate includes a highly thermally conductive material, the conductive material having a thermal conductivity in a range on the order of 45 W/mk to 420 W/mk nor do they note that

support substrate includes a highly acoustic attenuating material, the attenuating material for attenuating acoustics in a range on the order of 10 dB/cm at 5 MHz to 50 dB/cm at 5 MHz.

Note however that the Applicants themselves do not claim any specific material which meets these requirements. Therefore this aspect is regarded as a goal of the invention which is not supported by any structural material citation, therefore this carries no patentable weight, and as Eberle et al. show the claimed structure, this is regarded as being met by that reference.

The integrated circuit includes circuitry for performing at least one of control processing and signal processing functions of said ultrasound transducer probe.

Regarding the inclusion of an active region in the integrated circuit, what this may involve is not defined in the claim, ergo, as Eberle et al. show integrated circuits, and it is clear that these circuits are used, therefore active, in the working of the device, Eberle et al. are regarded as meeting this limitation. Note that the passivation layer may be considered as the substrate which clearly bends and which is regarded as meeting the fiber requirement since the material of the passivation layer is not at all defined.

Claims 5 and 18 are rejected under 35 U.S.C. 103(a) as obvious over Eberle et al. (US 6,618,916). Eberle does not note the thickness of his integrated circuit.

It would have been obvious to one of ordinary skill in the art to have the integrated circuits in the device of Eberle et al. on the order of approximately 5-50  $\mu\text{m}$ , if in fact they are not already, since it has been held that such a modification would have involved a mere change in the size of a component. A change in size is generally

recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

Claims 13-15 and 19 are rejected under 35 U.S.C. 103(a) as obvious over Eberle et al. (US 6,618,916) in view of Dinet et al. (US 6,859,984). Eberle et al do not note a protective layer covering the array of piezoelectric elements.

Dinet et al. teach use of a protective layer overlying an array of piezoelectric elements, said protective layer having a shape substantially conformal to said array of piezoelectric elements and further show (figs. 15-18) a non-linear surface of a support substrate. See col. 12, lines 9-14.

They do not show a flexible substrate with integrated circuits on it as part of the non-linear shape of the device or note use of such a substrate conforming to a non-linear shape. They don't note use of polyethylene.

It would have been obvious to one having ordinary skill in the art to provide a protective layer in the device of Eberle et al., such as is clearly taught by Dinet et al., in order to protect the transducer elements. Regarding recitation of the material, it would have been obvious to one of ordinary skill in the art to employ polyethelene as such a material since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

### ***Conclusion***

Art Unit: 2837

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Any remaining prior art cited reads on aspects of the claimed invention.

tmd

/Thomas M. Dougherty/

/TMD/

Primary Examiner, Art Unit 2837

August 14, 2009